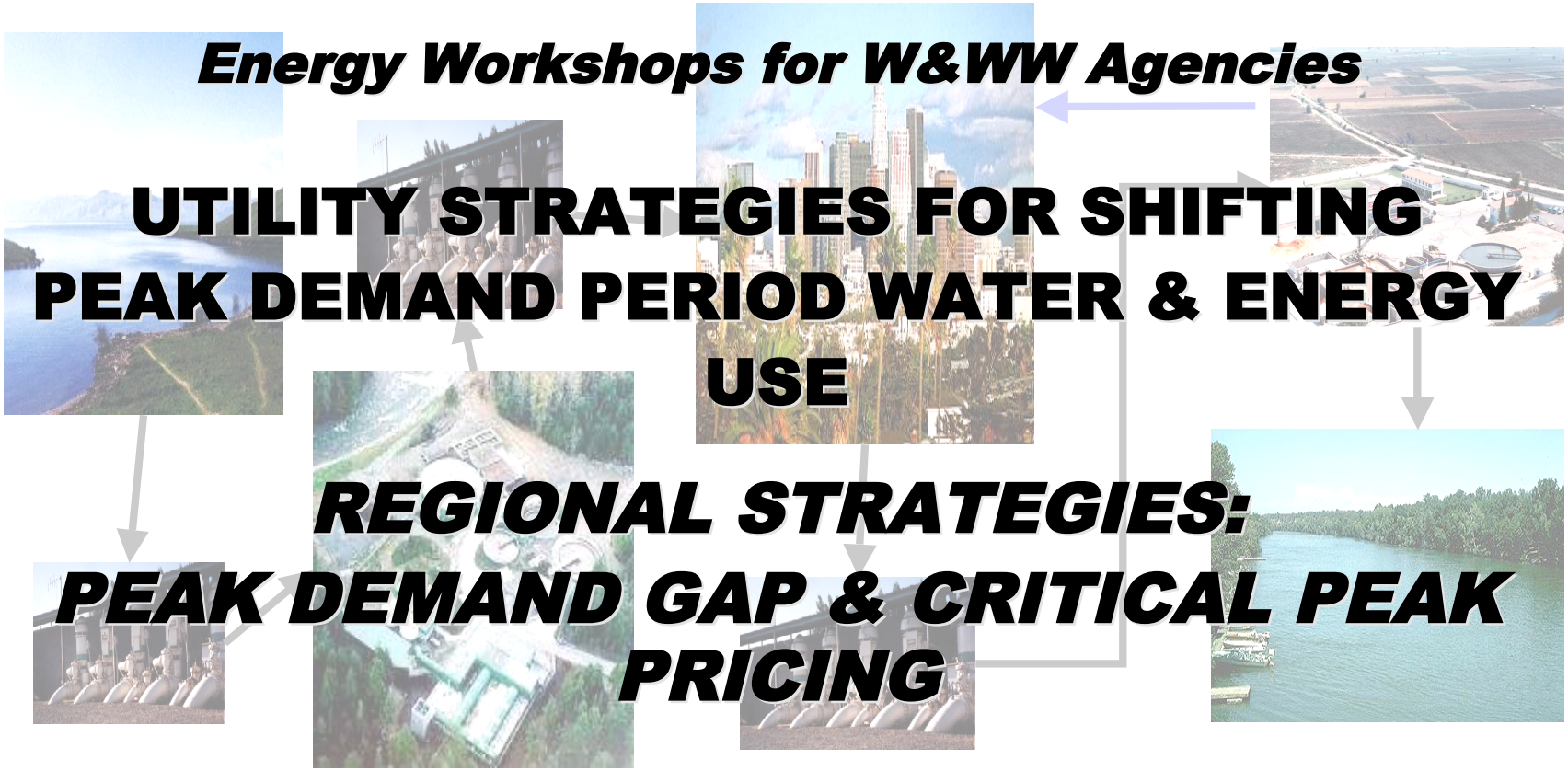


## *Energy Workshops for W&WW Agencies*

# UTILITY STRATEGIES FOR SHIFTING PEAK DEMAND PERIOD WATER & ENERGY USE

# *REGIONAL STRATEGIES: PEAK DEMAND GAP & CRITICAL PEAK PRICING*

***Shahid Chaudhry***
***California Energy Commission***
***August 2005***

- **California Energy Commission**

**CA's Energy Policy and Planning Agency**

- Historical Energy Data/Forecast Future Energy Needs
- License Power Plants
- Advance Energy Technologies
- Promote Energy Efficiency/Conservation
- Plan for State Response to Energy Emergency

- **Energy & Water**

## Worldwide –

**7.62x10$^5$ GWh (*i.e.* 7%) Energy Used Just for Pumping Water**

**~ = Energy Used in Japan + Taiwan**

**2 – 3 % to Pump + Treat Water for Urban and Industry**

## U.S.

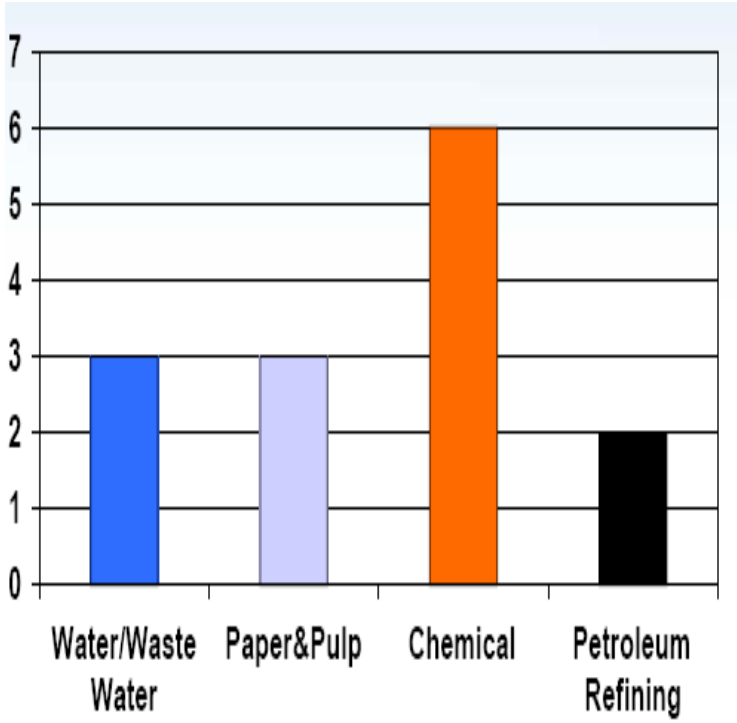
**75 GWh, *i.e.* 3% of the Total Elec. Use in U.S.**

## California

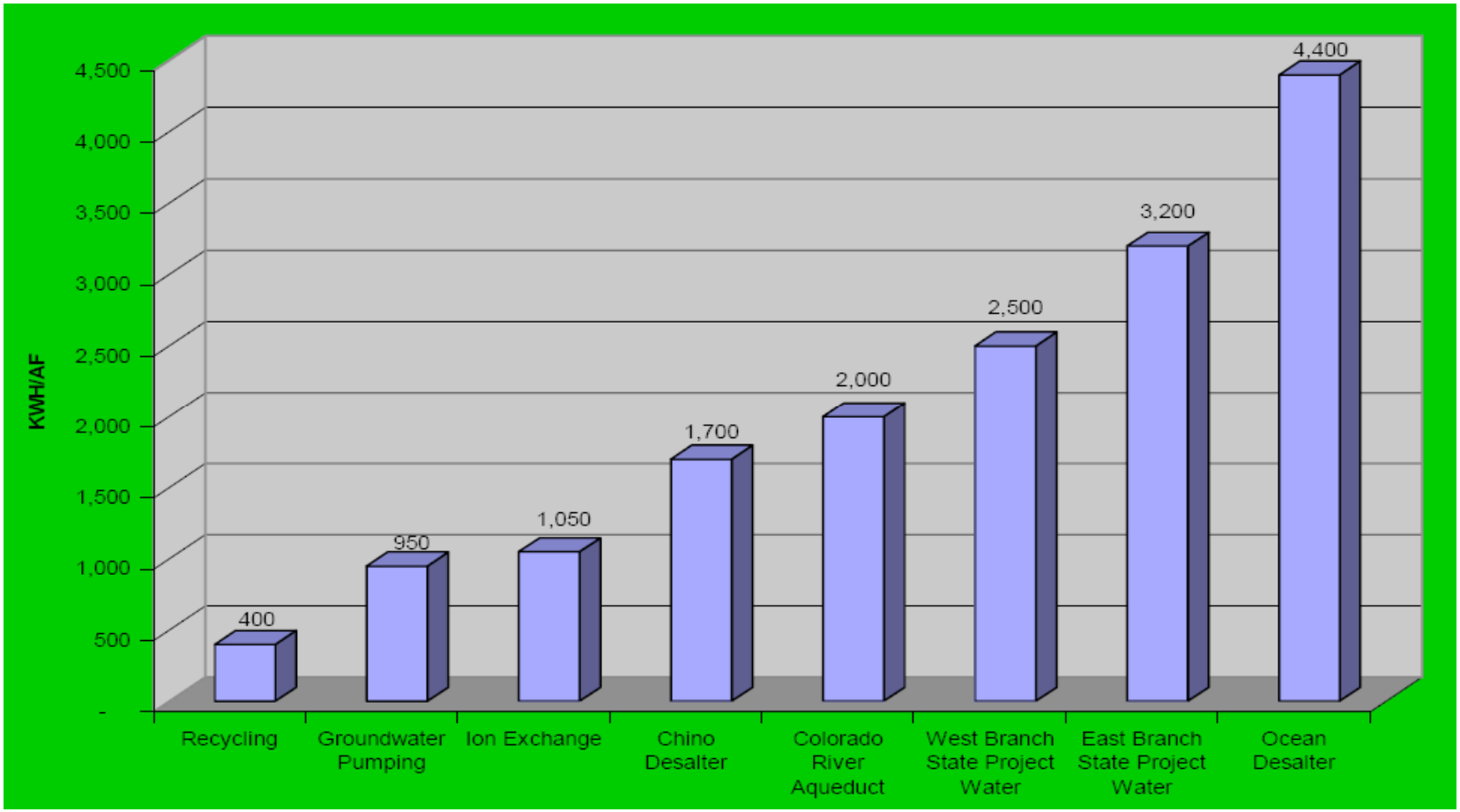
**15 GWH, *i.e.* 7% of the Total Elec. Use in the State**

### U.S. Energy Consumption by W&WW Sector

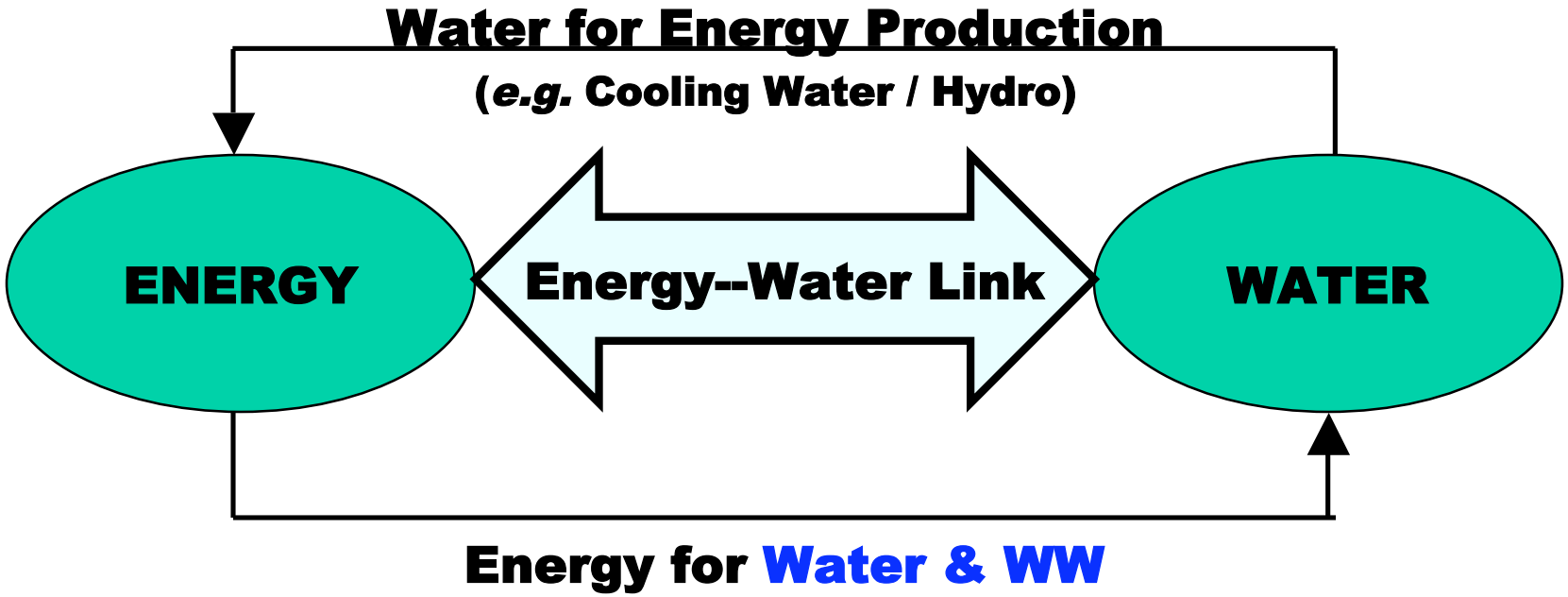
### (% of Total Elect. Generation)



- **Energy-Water Link in Southern California**



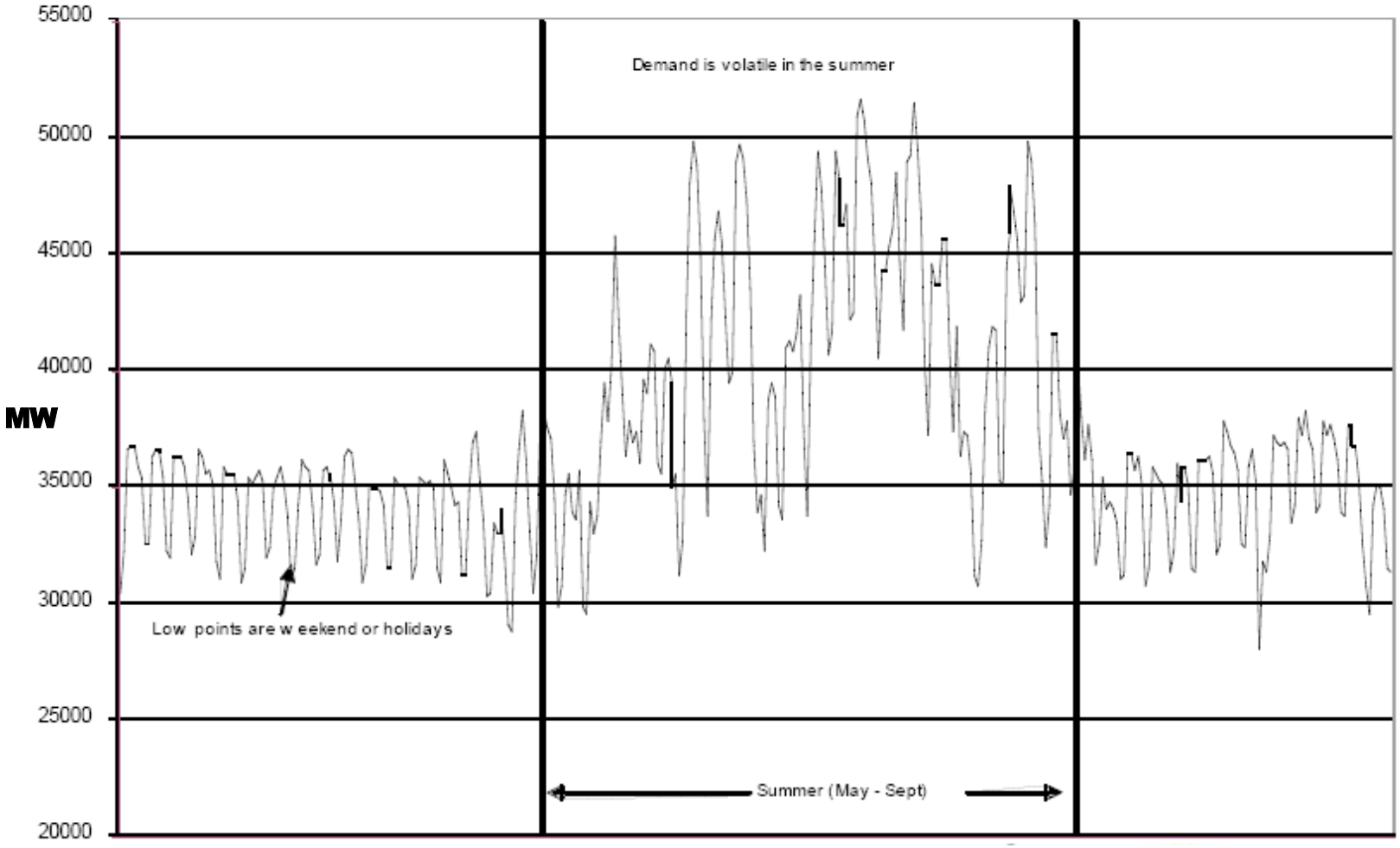
- **Energy-Water Link**



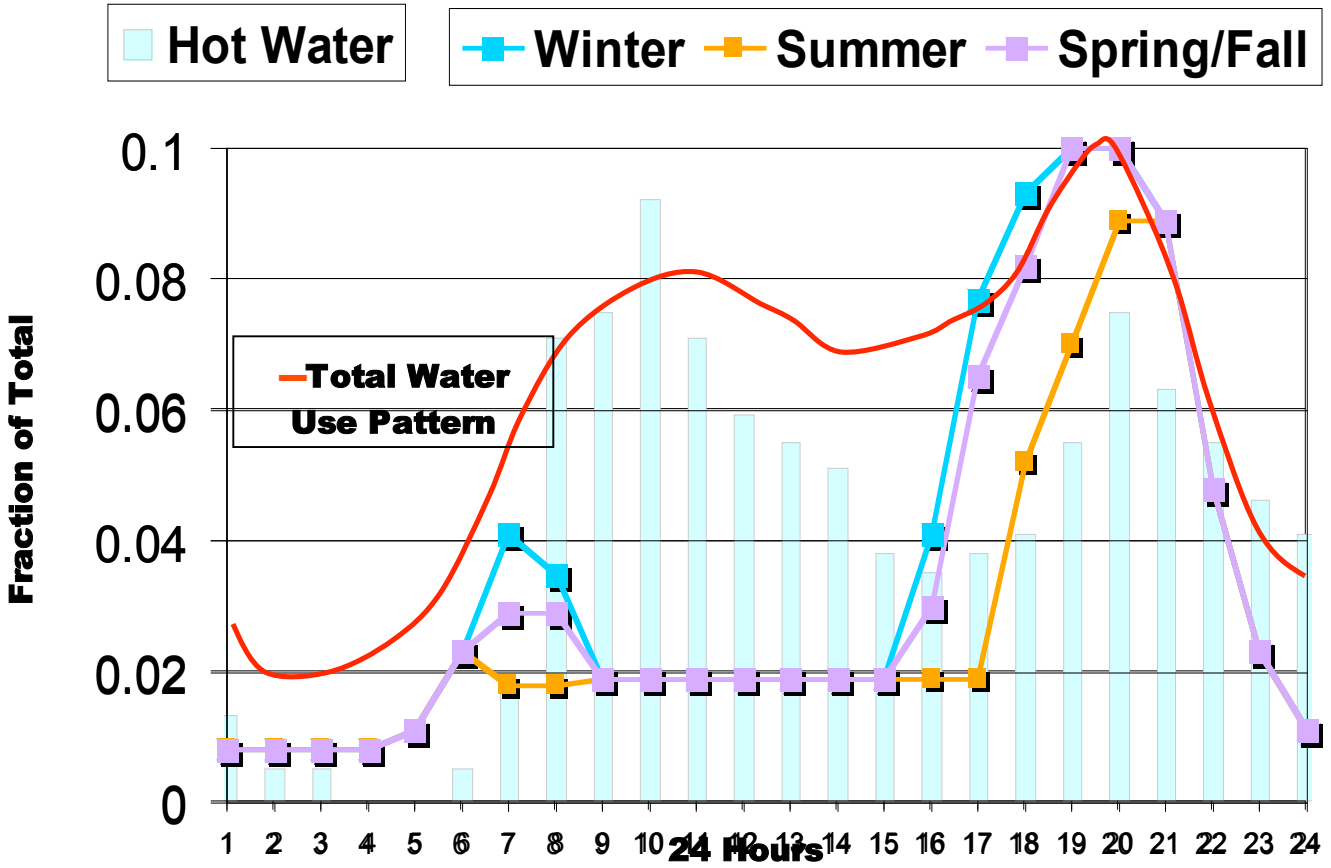

**Single Largest Expense for Many Utilities**
**Large Portion is Pumping Energy**

# BOTH, WATER & ELECTRICITY, HAVE PEAKS IN DEMAND

# Pattern of Daily Peak Demand in California

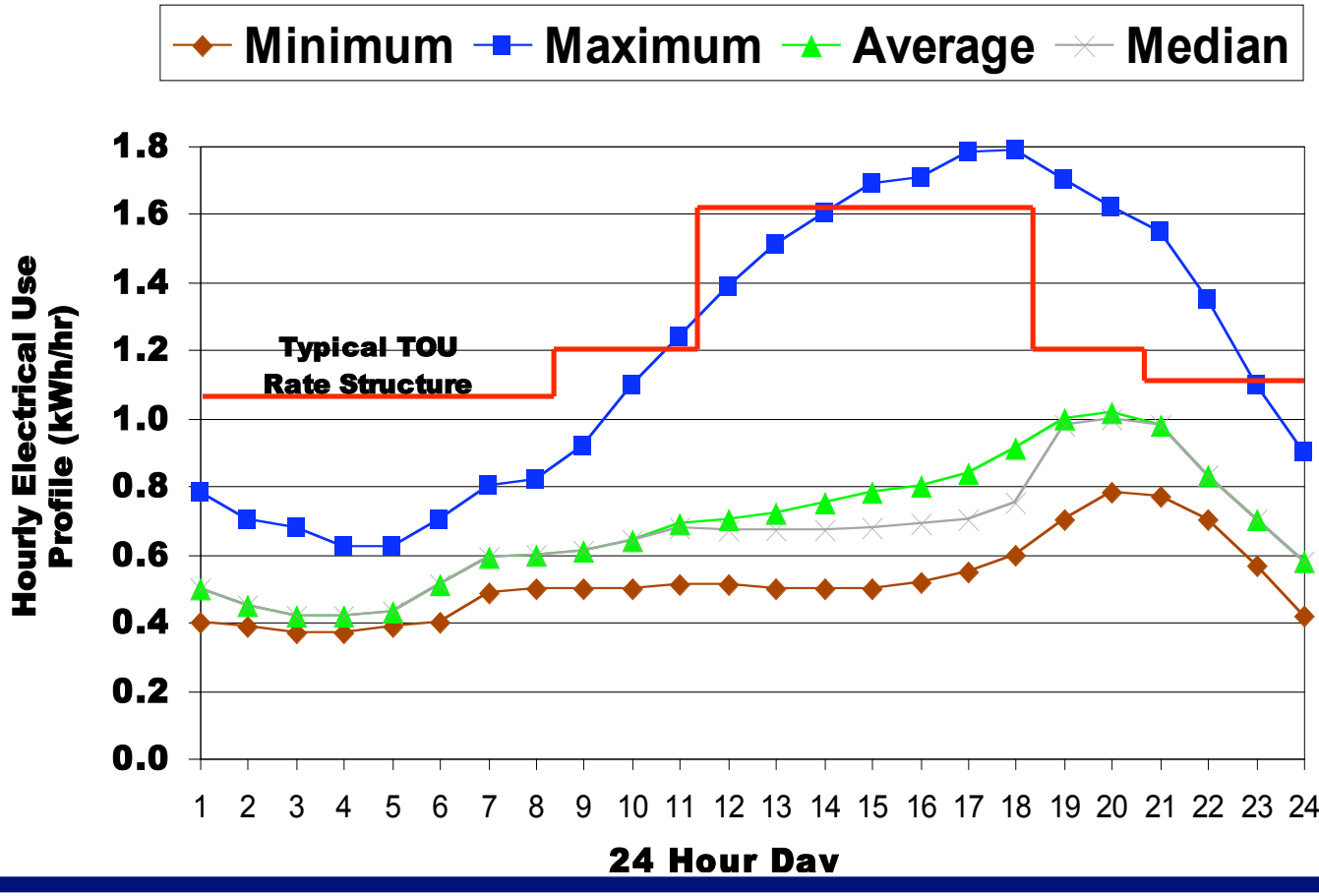


# Residential Water Use and Lighting Pattern



# Hourly Avg. Residential Load Profile

## (SCE Territory, 1999)



- **Energy for Water; Water for Energy; Water/Energy Used Jointly** (in Many Processes / Products)

- **Potential Solutions**

**Dual Approach** → **Supply Side & DS Management**
→ **Both Energy & Water Resources**

**Water Use Efficiency/Conservation/Loss Reduction**
**Electric Resources Management**

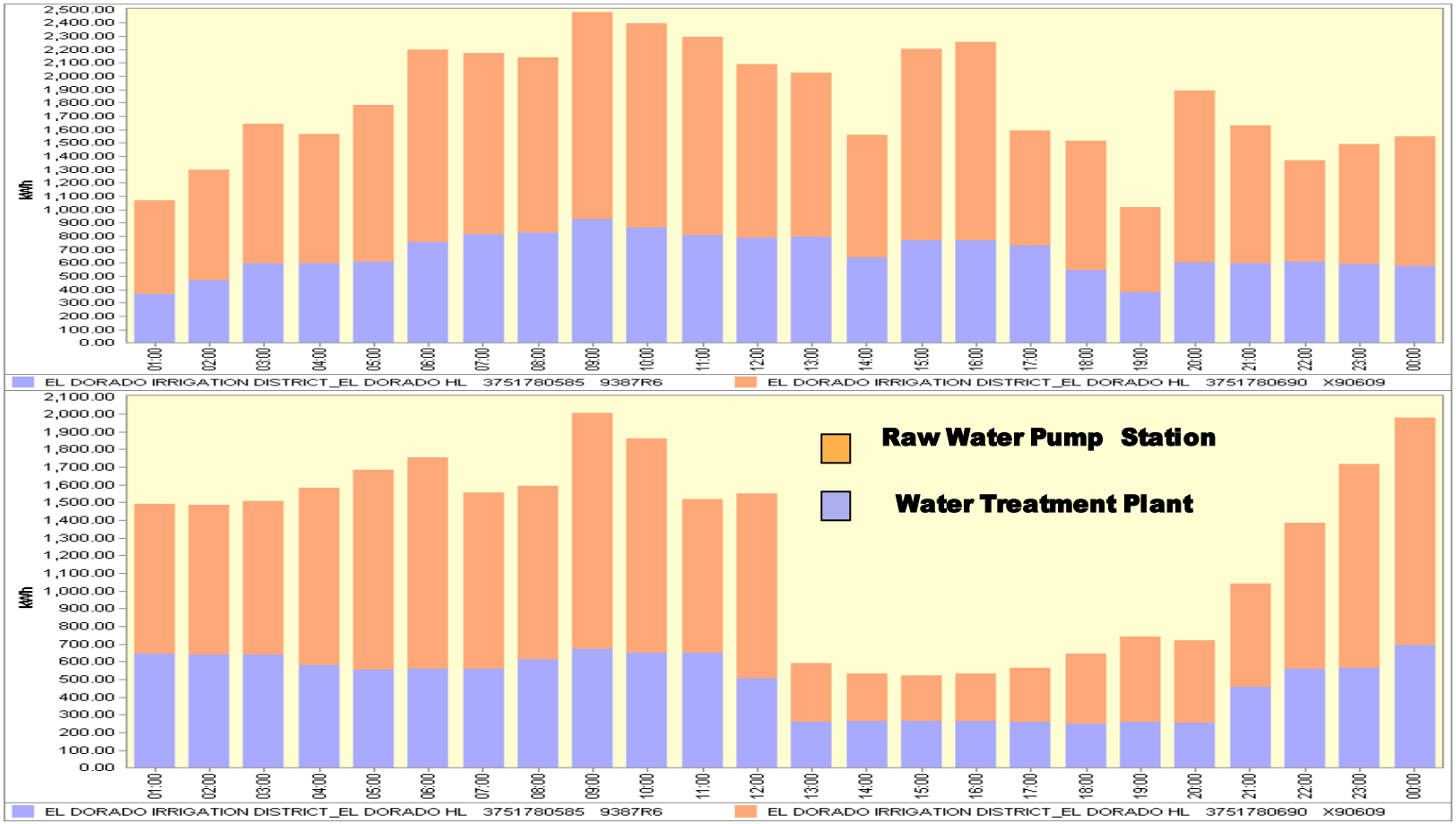
**TOU Rates; Water Storage/Pump Management;**
**Electric Demand Management through Water System**
**Conservation, Efficiency, and Distributed Generation**

**Market Transactions to Reduce Long-Distance Pumping (Exchanges, etc.), Water System Generation**

**Technology Alone is Not Enough – A Change in Behavior/Approach is More Important**

# EID Electric Demand Management through Rescheduling Pumping –

## June 2004 (11.56 MG) vs. June 2005 (11.03 MG)



- **Peak Demand Gap Concerns**

**Statewide Demand is More than Generation Capacity**

**Statewide Operating Reserves (7%) are Low under Hot Weather especially in Southern California**

**During Extended Hot Weather may Impact Economic Growth due to:**

**Higher Than Expected Demand**
**More Than Expected Outages**
**Lower Than Expected Imports**
**Transmission Problems Due to Forest Fires**
**Reduced Hydro Resources etc.**

- **Regional Strategies**

**Regional Coordination / Planning Needed**
**Emphasis on Energy Efficiency & Conservation**
**Focus on Demand Reduction**
**Add Generation / Renewables / DG Resources**
**Build Transmission Lines**
**Expand Natural Gas Infrastructure**

- **PIER -- $62 Million/Year RD&D Program**

  **IAW End Use Energy Efficiency, Environmental Research, Renewable Energy Technologies, Innovative Small Grants Program**

- **CEC's Self Generation/Cogeneration/ Emerging Renewable Energy Rebates***

  **< 30 kW System** –**

  | | |
  |---|---|
  | **PV** | **$2.80 / Watt** |
  | **Wind** | **$1.70 / Watt for First 7.5 kW** |
  | | **$0.70 / Watt for 7.5 kW to 30 kW** |
  | **Solar Thermal - & Fuel Cells** (using Renewable Fuels) | |
  | | **$3.40 / Watt** |

  **> 30 kW Systems:**

  **CPUC's Program Administered by IOUs**



* Effective 1.1.2005 ** For Owner Installed Systems, Rebates are 15% Less

- **Peak Load Reduction Programs**

  **AB970 / SB5X**

  **Curtailment, Energy Efficiency Retrofits, Distributed Generation, & Load Shifting**

  **AB970 52.16 MW Peak Load Reduced**
  **CEC Grants: $ 4.54 Million**

  **SB5X 17.78 MW Peak Load Reduced**
  **CEC Grants: $ 4.35 Million**
  **Total Projects Costs: $13.80 Million → $776 / Peak kW**

- **Energy Efficiency & Partnership Programs**

  **Technical Assistance & Low Interest Rate Loans to the W&WW Facilities to Identify and Implement Energy Efficiency Projects**

  **Up to 100% of the Cost of Energy Efficiency Related Project; No Minimum, No Match Needed; Maximum $3 M / Application; Simple Payback Period → 10 years or Less; First Come First Served Basis. Eligibility → Broad Range of Projects**

- **For More Information on CEC's Water-Energy Activities/Programs**

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